# Types of Rhinitis

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**KEYWORDS**

• Rhinitis • Allergic • Nonallergic • Occupational • Vasomotor • Irritant • Atrophic

**Key Points: Types of Rhinitis**

- Chronic rhinitis can be broadly classified into allergic, infectious, or nonallergic or non-infectious.
- Because of overlapping symptoms, the types of rhinitis are distinguished mainly by a careful history and, when indicated, allergy testing.
- The pathophysiology of nonallergic rhinitis likely involves a combination of inflammatory and neurogenic mechanisms that are poorly understood.
- The differential diagnosis is broad, and causes may include both local and systemic factors.
- Treatment involves having the patient avoid the offending agent, when possible, and use appropriate medications to control the predominant symptoms.

Rhinitis is a familiar disorder well known to primary care and specialty clinics alike. It affects up to 20% of the general population[1] and is one of the most common reasons for presentation to an otolaryngologist's office.[2]

Rhinitis is defined as inflammation of the nasal mucosa. This inflammation may be caused by a variety of factors, including infectious agents, allergies, irritants, medications, and hormones, among others. Associated symptoms may include excessive mucus production, nasal congestion, pain, pressure, sneezing, and pruritus. Acute rhinitis is often caused by infectious agents, such as viruses or bacteria, and is commonly associated with sinus inflammation as part of acute rhinosinusitis. More commonly, rhinitis presents as ongoing persistent symptoms, termed chronic rhinitis.

Chronic rhinitis can be broadly classified into allergic, infectious, or nonallergic-noninfectious. Allergic rhinitis (AR) is defined as IgE-mediated inflammation of the

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nasal mucosa after allergen exposure. It is definitively diagnosed through allergy testing, with either skin testing or serum-specific IgE antibody testing. Nonallergic rhinitis (NAR) is diagnosed when the history and physical examination are consistent and proper allergy testing is negative. Of patients seen with chronic rhinitis, approximately 50% of them will have allergic rhinitis as demonstrated on allergy testing.[3] The remainder are given the diagnosis of nonallergic rhinitis. The latter is a broad category that includes a myriad of causes, some known, and some unknown.

Nasal symptoms characteristic of NAR are often indistinguishable from those that occur in AR. A careful history is important in establishing a diagnosis and distinguishing the two entities. Within the category of nonallergic rhinitis are various described entities relating to the causative factor. These include irritant, medication-induced, hormonal, atrophic, nonallergic rhinitis with eosinophilia syndrome (NARES), and smoking. When no causative agent is found, the patient is given the diagnosis of idiopathic rhinitis.

## PATHOPHYSIOLOGY

The mechanisms that cause symptoms of rhinitis are complex and are likely multifactorial. Proposed contributions include chronic inflammatory and neurogenic sources.

### *Chronic Inflammation*

It is well established that in allergic rhinitis, there is an influx of inflammatory cells and mediators into the nasal mucosa as they respond to the offending antigen. These mediators result in venous engorgement, increased nasal secretions and tissue edema, causing the classic symptoms of nasal congestion, sneezing, rhinorrhea, and pruritus.[4,5] There are likely similarities in nonallergic rhinitis patients as well, though the relation is not as clear-cut.

Powe and colleagues[6] examined inferior turbinectomy specimens from allergic, nonallergic, and normal patients. They found significantly more nasal mucosa mast cells and eosinophils in the rhinitic patients compared with the normal individuals. They concluded that idiopathic and allergic rhinitic mucosa show similarities in their inflammatory infiltrate suggesting that both groups share a similar cellular immunopathology.

In contrast, a study by van Rijswijk and colleagues[7] found no difference in nasal mucosal lymphocytes, antigen-presenting cells, eosinophils, macrophages, monocytes, mast cells, and other IgE-positive cells between idiopathic rhinitis patients and controls.

### *Neurogenic Mechanisms*

The sensory nerves of the nose arise from the olfactory nerves as well as from the ophthalmic (through the ethmoidal nerve) and maxillary (through the nasopalatine nerve) branches of the trigeminal nerve. In the neurogenic model of rhinitis, exaggerated responses to environmental or endogenous stimuli occur because neural activity is upregulated as a result of a pathologic process, primarily of an inflammatory nature. In this case, a stimulus of average intensity generates exaggerated symptoms. This phenomenon is known as neural hyperresponsiveness and is believed to play an important role in the clinical presentation of nasal disease.

The neural regulation of the upper airways is complex and consists of a number of interacting nervous systems. Sensory, parasympathetic, and sympathetic nerves regulate epithelial, vascular, and glandular processes in the nasal mucosa. The sensory, parasympathetic, and sympathetic neural systems contain heterogeneous